BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

DEPARTMENT: NATURAL RESOURCES

JUN 2025

PROGRAMME: FAES

COURSE CODE ES413 (1) PROJECT PLANNING AND MANAGEMENT

DURATION: 2hrs TOTAL MARKS: 70

INSTRUCTIONS TO CANDIDATES

Answer THREE questions out of the following five questions. You must answer questions ONE from SECTION A and TWO from SECTION B.

SECTION A (COMPULSORY)

1. (a) A company is evaluating three potential projects (X, Y, and Z). The cash flows over five years are in the table below.

Year	Project X Cash Flow	Project Y Cash Flow	Project Z Cash Flow
0	-150,000	-100,000	-120,000
1	50,000	30,000	40,000
2	60,000	40,000	50,000
3	70,000	60,000	70,000
4	80,000	50,000	60,000
5	90,000	70,000	80,000

i) Calculate the Net Present Value (NPV) of both projects using a discount rate of 10%. **[15 Marks]**

ii) Based on your calculations, which project should the company select? Justify your answer. **[5 Marks]**

b) Draw a network diagram using the following activities and their durations and identify the critical path.

Activity	Duration (days)	Predecessors
A	5	-
B	3	A
C	4	A
D	2	B, C
E	6	D

[10 Marks]

SECTION B

2. A project has the following budget estimates and actual costs:

Cost Item	Estimated Cost	Actual Cost
Labor	60,000	70,000
Materials	30,000	25,000
Equipment	20,000	22,000

(a) Given that the Planned Value (PV) is 120,000. Calculate
(i) the Cost Performance Index (CPI) and **[5 Marks]**
(ii) the Schedule Performance Index (SPI) **[5 Marks]**

(b) Discuss the implications of your findings in terms of project performance and corrective actions that may be required. **[10 marks]**

3. (a) Outline the steps involved in the risk management process for a project. **[10 Marks]**

(b) A project has identified the following risks with their probabilities and impacts:

Risk	Probability	Impact (Cost)
Delay in delivery	0.25	30,000
Equipment failure	0.15	20,000
Regulatory changes	0.10	50,000

Calculate the Expected Monetary Value (EMV) for each risk and the total EMV for the project. **[10 marks]**

4. You have been assigned to manage a project aimed at developing sustainable forestry practices in a designated forest area. The project involves multiple stakeholders and activities.

a) Explain the concept of stakeholder analysis and its importance in natural resources management projects. Identify and describe at least four key stakeholders involved in the sustainable forestry project, their interests, and potential influence. **[10 Marks]**

b) Develop a stakeholder engagement matrix for the sustainable forestry project. Classify each stakeholder based on their level of interest (high, medium, low) and power (high, medium, low), and propose appropriate engagement strategies for each category. **[10 Marks]**

5. A community gardern project includes the installation of a new greenhouse. The project manager has provided the following budget estimates:

- Construction Materials: $45,000
- Labor Costs: $25,000
- Tools and Equipment: $15,000
- Contingency Fund: 12% of the total project cost

a) Calculate the total cost of the project, including the fund. **[8 Marks]**

b) The project duration is projected to be four months. Determine the average monthly expenditure for each budget category. **[12 Marks]**

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